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Road Accidents in Bengaluru City: A Comprehensive Study of Fatal and Non-Fatal Cases

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Abstract

Road traffic accidents are a significant concern in urban areas, reflecting the challenges of rapid urbanization and increasing vehicular population. This study analyzes accident data from Bengaluru City between 2015 and 2022, focusing on fatal and non-fatal cases, along with the associated injuries and fatalities. The findings reveal fluctuations in accident statistics, with a notable decline in cases during the COVID-19 pandemic. This paper aims to provide insights into accident trends and offers recommendations for improving road safety and reducing accidents.

Keywords: Road traffic accidents; Bengaluru City; Fatalities; Injuries; Urban traffic; Road safety; Accident trends

1. Introduction

Traffic accidents are a major public health and safety issue worldwide, particularly in rapidly urbanizing regions. Bengaluru City, known as India's IT capital, faces significant challenges in managing its growing traffic congestion and road safety. The city's accident statistics highlight the critical need for effective traffic management and road safety measures. The increasing vehicular population, coupled with inadequate road infrastructure and inconsistent enforcement of traffic regulations, exacerbates the situation. With its status as a burgeoning metropolis, Bengaluru's road safety concerns reflect broader urban planning and governance issues faced by many Indian cities.

This paper examines the trend of fatal and non-fatal accidents in Bengaluru

from 2015 to 2022, with an emphasis on identifying patterns, contributing factors, and potential interventions. The analysis aims to bridge the gap between statistical insights and practical recommendations for mitigating road accidents.

1.1 Study Area

Bengaluru, the capital of Karnataka, is a prominent metropolitan city in southern India. Known as the "Silicon Valley of India," Bengaluru is a hub for information technology, startups, and innovation. The city covers an area of approximately 741 square kilometers and has a population exceeding 10 million as per the 2011 Census, making it one of India's largest cities. Bengaluru is characterized by its rapid urbanization, with significant growth in infrastructure, industries, and vehicular density.

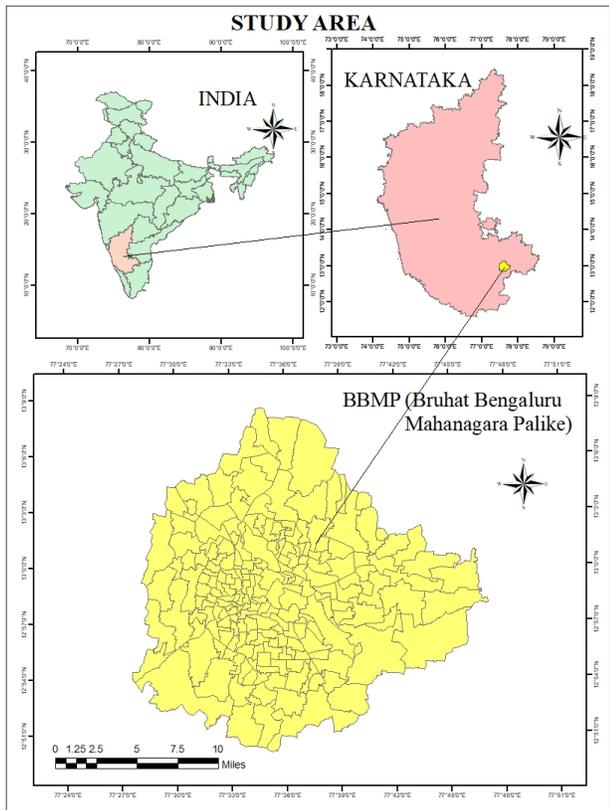


Fig. 1. Location map of Bengaluru city

The city’s road network spans over 11,000 kilometers, including national highways, arterial roads, and residential streets. However, the exponential rise in the number of vehicles—estimated at over 80 lakh by 2022—has outpaced infrastructure development. Traffic congestion and accidents have become critical challenges. Bengaluru’s climate, marked by moderate temperatures and monsoonal rainfall, impacts road conditions and contributes to traffic issues. The city’s economic activities, ranging from IT services to manufacturing, draw a diverse population, further complicating its urban traffic dynamics. This study focuses on these aspects to understand the trends and implications of road traffic accidents in Bengaluru.

1. 2 Review of Literature

Studies on road traffic accidents have consistently highlighted their multifactorial nature, involving elements such as road conditions, driver behavior, vehicle types, and traffic management systems. Research by Mohan et al. (2018)⁽¹⁾ emphasizes the role of urban planning and infrastructure in mitigating accidents. A study by Singh and Gupta (2020)⁽²⁾ highlights the impact of increased vehicular density on accident rates in Indian metropolitan cities. This paper builds on existing research by focusing specifically on Bengaluru City, a hub of

economic and technological growth, and examines its unique traffic challenges.

1.3 Objectives

1. To analyze the trends in fatal and non-fatal road traffic accidents in Bengaluru City from 2015 to 2022.
2. To assess the impact of accidents in terms of fatalities and injuries
3. To identify potential factors contributing to the observed trends
4. To recommend strategies for improving road safety in Bengaluru

2 Methodology

This study utilizes secondary data collected from official traffic and accident reports for Bengaluru City between 2015 and 2022. Descriptive statistics were employed to analyze the trends in fatal and non-fatal accidents, along with associated injuries and fatalities. The data was categorized by year to identify patterns and significant deviations. The COVID-19 pandemic’s impact on accident trends was also considered.

Results and Discussion

The analysis reveals that fatal accidents ranged from 334 in 2020 to 754 in 2016, with corresponding fatalities ranging from 344 to 793. Non-fatal accidents exhibited a significant decline in 2020, coinciding with the COVID-19 pandemic and reduced vehicular movement. However, post-pandemic years, such as 2021 and 2022, saw an increase in both fatal and non-fatal cases, indicating a return to pre-pandemic traffic conditions.

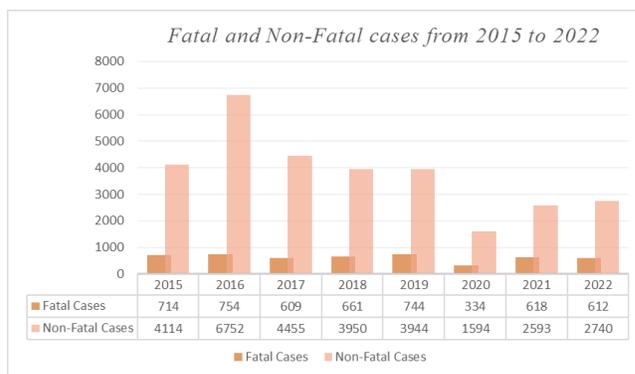


Fig. 2. Year-wise Fatal and Non-Fatal Accidents

The highest number of injuries occurred in 2016, with 6,752 non-fatal accidents resulting in 4,193 injuries. In contrast, 2020 recorded the lowest figures, reflecting the impact of lockdowns and reduced mobility. A gradual



Table 1. Accident Statistics in Bengaluru City (2015-2022)

Year	Fatal Cases	Persons Killed	Non-Fatal Cases	Persons Injured	Total Accidents
2015	714	740	4114	4047	4828
2016	754	793	6752	4193	7506
2017	609	642	4455	4256	5064
2018	661	684	3950	4133	4611
2019	744	766	3944	4253	4688
2020	334	344	1594	1678	1928
2021	618	651	2593	2828	3211
2022	612	639	2740	2901	3352

increase in accidents in subsequent years underscores the need for targeted road safety measures.

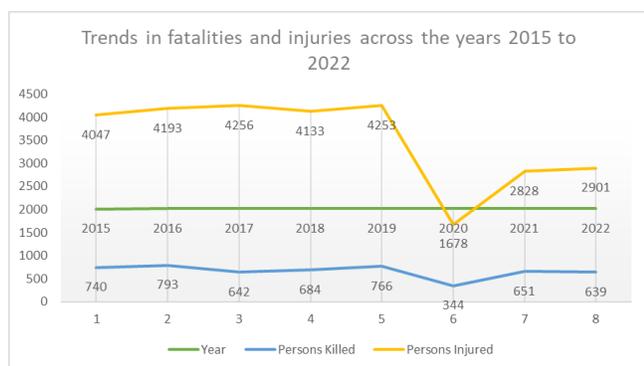


Fig. 3. Persons Killed and Injured (2015-2022)

The growing vehicular population, inadequate traffic management, and infrastructure challenges are key contributing factors. Despite efforts to improve road safety, enforcement of traffic regulations remains inconsistent, contributing to high accident rates.

4 Recommendations

Improving road safety in Bengaluru requires a multi-pronged approach involving infrastructure enhancements, policy interventions, and public engagement. First, traffic management can be strengthened through the implementation of intelligent traffic systems, including AI-driven traffic lights

and real-time monitoring. Upgrading road infrastructure, such as maintaining roads, creating pedestrian-friendly spaces, and ensuring proper signage, is crucial.

Public awareness campaigns focusing on road safety education, including helmet and seatbelt usage, and discouraging drunk driving, can significantly impact driver behavior. Simultaneously, strict enforcement of traffic regulations, such as speed limits and lane discipline, is essential. Developing efficient emergency response systems to address accidents promptly can help mitigate fatalities and injuries. Collaborative efforts between government agencies, urban planners, and citizens are vital for fostering a culture of safety and responsibility on Bengaluru’s roads.

5 Conclusion

Road traffic accidents in Bengaluru City remain a critical issue, reflecting the need for comprehensive measures to enhance road safety. While the COVID-19 pandemic temporarily reduced accidents, the resurgence in post-pandemic years highlights persistent challenges. By addressing infrastructure deficits, enhancing traffic management, and promoting public awareness, Bengaluru can make significant strides toward safer roads.

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